BIO-DYNAMICS

A periodical furthering soil conservation and increased fertility in order to improve nutrition and health.

FALL 1959

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THE ANNUAL B. D. CONFERENCE

Recent assertions published in a daily newspaper to the effect that concern with natural foods and the relation between soil fertility and the nutritive value of crops came under the heading of "food faddism" were challenged by Dr. E. E. Pfeiffer when he addressed the annual B. D. Association Conference held at Threefold Farm, Spring Valley, on August 22, and 23.

He did so, not by reference to his own published research, but largely by quotation from a paper delivered on May 28th of this year at a meeting of the European Medical Collegium at Monte Catini, Italy.

The New York Times writer, June Owen, in a column published on August 12th, quoted Dr. Frederick J. Stare of the Department of Nutrition at Harvard University to the effect that besides there being no one 'best' pattern of eating,

" 'Good nutrition depends upon securing sufficient amounts of the specific nutrients, and *it makes little difference if the amino acids come from beef or grasshoppers or the ascorbic acid from oranges or potatoes.*' "*

The most serious allegations in the Times article, confuted, as Dr. Pfeiffer pointed out, by the published findings of many scientists including men working at U. S. governmental research stations, were presented in the concluding paragraph of the piece, in which Dr. Stare was only indirectly quoted as follows:

"Dr. Stare said that one breed of food quacks were those who advocated 'natural' foods and who contended that our soil was worn out, our food worthless and our people all sick. They insist on 'natural' organically fertilized soils, but what primarily affects the composition of a food is the genetic make-up of the seed, not soil fertility. The chief effect of increased soil fertility is a rise in crop yield, not a change in the nutritive quality of the crop."

Dr. Pfeiffer pointed out in reference to the part that genetic make-up does indeed play, the well-known fact that "seed selection has, for the past 50 years, been primarily aimed at a higher pound per acre yield, and scientists acknowledge that the pro-

* Italics are ours.

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tein quality of our food crops has been declining." He recalled also the 1958 meeting of UNESCO's Food and Agriculture Organization at Rome, where scientists reported that the deterioration of food quality contributes to the recent increased spread of cancer.

He then cited the above-mentioned paper presented in German at the Monte Catini meeting, as published in "Hippokrates" at Stuttgart, Germany, a Journal for Applied Medicine and Integration of Medicine, in its July 31st issue.

The speaker, Geheimrat, Professor Reinhard Demoll, M.D., the University of Munich, concerned with UNESCO findings on the respective curves of world population and world food production figures, put the question as to whether the increase of food production could keep up with world population increase, and went on to state:

"The careful investigations of the FAO of the United Nations show that we have just reached a production level equivalent to that before the War (World War Two). But the shape of the curve is hardly encouraging as far as the outlook for the future is concerned.

"A false but wide-spread optimism concerning what is actually a fast-growing increase of world-wide food production, starts from the fact that while a low point was reached during the War, this has, after the return of more ordered conditions, been gradually left behind. True enough, the curve climbed upward after the War. But it only climbed steeply in the first years after the end of hostilities, then began increasingly to level off, and appears at present to have already gone by its highest point. That is, the drop began right after it had approached the per capita production of the pre-war time. For the ever slower rate of increase of production, that began in 1953, has already become a slow decline from 1957 to 1958.

"While the world population is increasing at an ever faster rate, food production has shown an absolute decline of 1 per cent, the per capita production at least 2 per cent. If the present trend continues, this means that in 10 years there will be one fourth less produced. Also, the decline has thus far proceeded in a very uneven fashion. It is particularly strong in the hungry countries, above all in India. This makes the situation worse. Excess production in the U. S. A. benefits only those who can buy it. But even outright gifts of the American surplus would only give the hungry peoples an increase, (per capita), of one cup of rice per month, or a teaspoonful every two

days. Yet many of the beneficiaries cannot even pay for the transportation of the food. However, if one were able to make a proper, equal distribution of all the foodstuffs to everyone, then all of the people of the world would be hungry.

"The president of the World Food Organization has stated: 'There is, on the average, less food per capita than before the last War'.

"Furthermore, it is qualitatively of less value. Before World War II, the hungry people had more animal protein, i.e. protein of higher value, available to them.

"This must allow us very greatly to doubt whether technical progress will, as is prophesied, be able to save us from total starvation."

Quoting further from the paper, Dr. Pfeiffer cited Professor Demoll's reference to irresponsible use of soil resources as one of the factors making for an ever-worsening situation, and his slight confidence in the benefits from the prospect of artificial production of amino acids. Demoll, he went on, also sees no future in the growing of plants in nutrient solutions, since the absence from these of important soil bacteria makes the plants very weak and frail.

Demoll had continued by posing the question as to what would happen, if, all over the world, men suddenly became reasonable, and treated their fields, woodlands and water resources in a better fashion. The difficulty here, the paper stated, is that to begin with it must be acknowledged that "to a large extent the deeds of men have already created irreparable conditions". Despite astronomical expenditures on flood control dams in the U. S. A., Demoll says, one can hear worried voices raised to the effect that this country is losing the fight against the incoming steppe and desert.

"We already can calculate how soon Mexico, South Rhodesia and northern Nyassaland will be entirely free of humus. Thus even if one began today to try to proceed in a reasonable fashion, the humus that has already flowed into the ocean cannot be brought back, neither in the U. S. A., where the loss of humus is comparable to a loss of 4000 acres every day, nor in all the other parts of the earth, South and Central America, Africa, Asia and Australia. Also in Germany, it has been established that there is a loss of humus of 5 to 7 inches a year. It would take thousands of years to rebuild this humus."

Quoting again from the Demoll paper, in relation to irriga-

tion as a means of overcoming the difficulties, Dr. Pfeiffer read:

"German irrigation possibilities are today already very limited. Our streams are tending toward drying up, with the result that at the time of year when irrigation is most urgent they have such a high sodium chloride content that their water is no longer usable on the fields — quite aside from phenols and oils (industrial wastes) to be found in them. Thus, the water of the Rhine, Neckar and Weser is unusable.

"Despite the ever greater efforts of science and industry, we have reached the point at which the absolute and the per capita production of food are going downhill."

Regarding the ground water table, Demoll commented:

"The more the crowding together of people (in cities and industrial areas), the more does the ground water table fall, and fall everywhere; the more this drops, the more poison does the housewife bring, in her market basket, into the kitchen."

Dr. Pfeiffer quoted further from Professor Demoll's paper and reported the German scientist's conclusion that the quality of food was becoming lower and lower, and the soil, poisoned by the sprays and fertilizers used in general agriculture practice, was producing less crops, and this smaller production is of less food value in itself.

"There is nothing I can add to this", Dr. Pfeiffer commented. He ran briefly over the final suggestions of the Demoll paper, to the effect that the solution of the dilemma lay in governmentally sponsored projects for limiting population increase, along with still further efforts to raise quantity levels of food production. With these Dr. Pfeiffer disagreed, affirming rather that with a proper emphasis on *quality* production — both in terms of fertilizing methods and of seed breeding for higher protein content, etc., "we can feed all the people in the world, with half the present production."

Feeding the world population is entirely possible as soon as the soils are re-conditioned, he said, but pointed out that the first step is the production of sufficient humus to hold the soil. He went on to say that such basic problems were a concern of his laboratory, being steadily worked on there.

Such a concern for the future feeding of the world population, the speaker observed ruefully, is scoffed at as "idealism". Lashing out at people who approach the question of natural foods only from the point of view of their own personal, healthy diet, he characterized this attitude as no more than a kind of "belly worship".

"If you are just interested in the organic movement for your own satisfaction", Dr. Pfeiffer asserted, "you are not much better than those who limit themselves to finding ways to increase quantity production. The problem is whether we have a moral concept or not, if we decide to work for the benefit of humanity or not. If we, all of us, can stick it out for another ten or fifteen years, I believe that the others, now going in different directions, will want to learn from us how to produce the humus that is the first necessary step to rehabilitate the soil.

"The scientist tells us that we are animals on the way to becoming human. I think that what is needed is a complete reversal of our inner orientation. We have to develop a philosophy upon which we can stand with our mind and soul and ideals.

"To make B. D. work is a matter of philosophy. If you are out just for your own gain, you will get no further. If you work at it because of your feeling of human dignity, and feel that you have got to do it as long as there is a single human being who is hungry, then you begin to walk the path that leads to becoming *human.*"

In another lecture, on "Food Quality and Food Testing", Dr. Pfeiffer stated that the biological value of a food (or of a compost) is not exclusively related to that which chemical analysis shows. Yet, he pointed out, it is important for health, of the human, animal or plant, for the producer to have some means of checking on biological values. This lecture presented the progress he and his associates in the Biochemical Research Laboratory have made in developing such tests. Readers interested in more information on this subject will find the material in a paper by Dr. Pfeiffer, published in Bio-Dynamics, Number 50.

The other lectures, demonstrations and question and discussion periods of the two-day conference went off as scheduled in the previously announced program. Those present were able to get information on many practical farm and garden problems — a wealth of detail impossible to present in a report like this. As many as possible of the Conference talks and lectures are, however, presented elsewhere in this issue.

The sessions were well attended. Including people from nearby as well as those who came greater distances, the total was over 200. There were at least 15 States and the Bahamas represented among those attending the conference.

FRED HECKEL

REPORT ON A FAMILY FARM

LUDWIG PIENING

All the reports given at the 1959 *Summer Conference under the general heading "The Biodynamic Farmer Speaks" were well worth hearing. One of the most outstanding was that of Mr. Ludwig Piening, which follows. It is particularly encouraging in a time when one so often hears that "the family farm" has been outmoded by present-day social and economic conditions. But, lest any happy enthusiast be thereby tempted to plunge into deep waters, let it be remembered that Mr. Piening, although he was new to this country, is and was a practical farmer of long experience.*

While I have been farming all my life, my experience in farming in America is limited. In May 1951 our family came over from Europe, and immediately thereafter I set out to find a farm where we would live. Restricting my traveling to Up-State New York, I finally decided to settle in Montgomery County, South of the Mohawk River, 50 miles West of Albany, on a plateau 1200 feet above sea level. Buying a farm is easier said than done. One cannot look for the best only, but has to stay within one's means. Our farm had to be big enough to produce the volume needed for a family of 9. The ideal farm, I believe, cannot be bought; much, however, can be accomplished in the run of the years, and today one would hardly recognize the run-down place of 8 years ago.

1951 was a wet year. We had a late start in haying, and it rained and poured alternatingly. Large accumulations of water on level land, run-off and erosion on slopes, clearly showed that control of water would have to be the main objective for the first years. Today many thousand feet of diversion ditches, open-drainage ditches and sodded waterways intercept run-off and divert the water to protected outlets. On land too level for ditches we resorted to bed plowing. It is not a problem any more to get the land ready in the Spring for small grain and seedings. At the same time we tried to retain water by introducing contour-plowing, strip cropping and constructing ponds for livestock watering.

Our farm totals 310 acres, of which 280 acres are tillable. The rest is woodland. All fields have been re-seeded, mostly to birdsfoot trefoil, with either brome grass or timothy. Our soil is silt loam on clay subsoil with a high potash content, low on

phosphorus and slightly to moderately acid. An early attempt at growing alfalfa failed, but this year's seeding, after several years of working the land and composting, looks promising. Birdsfoot trefoil is thriving; we had a wonderful stand in 1958. This year it was quite the opposite. A severe winter without snow but with thick layers of sleet-ice covering the fields for months, winter-killed most of the legumes in the County, reducing the hay crop drastically. In addition to this, a drought set in around mid-June, preventing any new growth — pastures dried up, milk production slumped.

Two adjoining fields, both planted to Sudan grass, showed a marked difference in development. The one, fall plowed, worked and composted in the Spring, was seeded to Sudan grass the same day as the neighboring field, which was plowed in May, worked, and seeded, along with the application of 300 lbs. of 10-20-20. The first field was always ahead in growth and never wilted. This shows what proper cultivation and composting will do with regard to retaining moisture, especially in a dry year. I, for myself, draw still another conclusion: the daily spreading of fresh manure is a waste any farmer can ill afford.

The progress made on a dairy farm should be noticeable in the herd, i.e. its state of health and its production. We have no "health troubles", the cows settle with calf generally after first service, calving is easy and losses in raising calves are nil. We raise 15 heifers a year. Our production approaches 12,000 lbs. of milk and 400 lbs. of fat; total milk sold 360,000 lbs. annually.

Of course, things are not progressing as smoothly as all that might sound, there are always ups and downs, sometimes this, sometimes that, is the limiting factor. The barn began to be too small, and it urgently needed extensive repairs. Money was short and prices for a new barn high. We knew we had no merchantable lumber in our woodlot, but we had elm trees and second class hemlock. So we started to fell trees, have them sawed, and we cut out the pieces for rafters, etc. Two years ago we finished the first half of a new barn, and this year the second half. The over-all length is 135 feet, with a width of 36, and a milkhouse and a granary are attached. Next year two silos will follow. The total cost is $7,500 complete, not counting our own lumber and labor. The lumber, as said before, was of no marketable value, and the farmer's time — as

the saying is — "is not worth anything". This is true inasmuch as he does not pay himself any wages.

Very often it is hard to determine how much a given job returns in dollars and cents. Take working in a woodlot, for instance. How much are you earning in improvement cutting, i.e. taking out weed trees, undesirables, etc., cutting your firewood supply and lumber for repairs? It is often said: "We do not work our woodlot, because we cannot afford to work for so little". One should not forget how really little one gains in watching television. Besides, the secret of successful farming is not in the constant looking for a cash return for every move made, but rather in *how* man performs in observing, understanding and recognizing nature, that is in working with his soil, his plants, and his animals to bring about a biological balance of the whole. In doing this you will observe that it is man who can maintain this balance or destroy it, and you will learn to understand man's role, his task, his responsibility and his dignity. And so it may not be a surprise that if I were young again and were granted the choice of a profession, I would unhesitatingly say: Let me, please, again become a bio-dynamic farmer.

COOPERATIVE MARKETING

C. RUSSELL KEEP, JR.

The last year has demonstrated that the co-operative method of distribution is, in spite of its many limitations, the best means for getting bio-dynamic food from farm to consumer. Up until a year ago the only methods for the buying and selling of organic produce were through health food stores in major metropolitan areas, direct mail, and the weekend drive out to the farm. None of these was satisfactory for the majority of the producers and consumers of organic food: health food stores were and still are more interested in shelf-life and high profit items, direct mail is only possible for non-perishable items that can withstand shipping, and the weekend trip to the farm often finds the farmer seasonally out of most of his produce, and hoping to spend a quiet Sunday with his family.

The co-operative changed all this. It enabled the farmer to know in advance what food his consumers wanted and the size of his market. For the first time there was an orderly relation developed between supply and demand. The co-op en-

abled the housewife to secure a maximum amount of her family's food direct from the farm once a week. The co-op saved time and it saved money, but most importantly it created a market in which organic and bio-dynamic farmers can now plan their production a year in advance knowing that the merchandise will be sold to the people for whom it was intended.

The consumer by forming together in small co-operatives does more than pool purchasing power, she creates an area of time, a market place, in which it becomes possible for the farmer to plan and execute activities not possible when he does not know from day to day to whom his produce will go. There is a year's time between most crops and up until now no group has been able to bridge effectively the distance. The co-ops have. For the first time large farm units can place all their production on the organic market.

The co-operative movement in organic agriculture can be an effective force so long as it is judged by what it is and not as is so often the case by what it is not. The tendency among members of a co-op is to look on this method of purchasing food as though it were a grocery store — a badly managed, ever-priced one at that, and only open one day a week. The co-op cannot survive the mistaken identification with the supermarket, but it can replace what the supermarket has made obsolete, market day.

Market day once was an important phenomenon in America, for there not only goods were exchanged but so were ideas and convictions. Acquaintances were made and a new and vital part of the outside world entered the home life at a personal level. The functions of market day, and the marketplace have been taken over separately by the supermarket and television on an impersonal level. Market day is just what people interested in natural foods need. It is less than the convention meetings and more than a home discussion group. It is the proper environment — the market place — of ideas. It is just the right combination of putting your money where your mouth is.

The co-op establishes market day as one particular day in the week and brings together people who do not see each other ordinarily but who have much in common. The co-op is the marketplace of the natural way of life.

The supermarket on the other hand makes the purchasing of food convenient and inexpensive, but the price we pay for this ease is no more market day. You can shop from 8 A. M.

Monday through 8 P. M. Saturday, there is no market day, or market place, only the supermarket. In the market place the responsibility for quality rests upon both the farmer and the consumer: the housewife must know what good food is and so must the farmer. At the supermarket the responsibility for quality has been taken away from the farmer and the consumer both, for the technique of marketing is not primarily the technique of quality. The co-op restores quality as the proper concern of producer and consumer. It restores the market place.

In areas where co-ops do not already exist, the producers and consumers must first get together and make an appraisal of the supply and the demand. Locations or households should be chosen as centers for distribution and a person put in charge of each co-op. The farmers and producers must decide who among them is most qualified to act as the coordinator of their production and this person or persons should arrange for the shipment of goods to the co-ops on a weekly basis. If this first group can succeed, the idea will then spread easily and naturally. The organization of this first group will take however a great deal of patience and perseverance.

Every area in the country should be able to form and sustain co-ops made up of local producers and consumers, and if such a network of cooperatives developed across the country it would facilitate the distribution of surplus items from one area to another. There are enough people everywhere interested in how their food is grown to form co-ops, co-ops which would create a market place for organic and bio-dynamic food thus assuring the development of organic agriculture in our economy and the nutritional well-being of our families.

FARMER WANTED for Bio-Dynamic Dairy farm in New Jersey. No commercial fertilizers nor poison sprays used for past 8 years. This is a modern farm that needs an experienced farmer. Completely equipped. Modern house and good salary. Write stating experience, age and size of family to Box 36, BIO-DYNAMICS, Threefold Farm, Spring Valley, N. Y.

INTENSIFYING A B.D. HOMESTEAD PRODUCTION

ERNST FLORIAN WINTER

You will understand, I hope, that in a report on our pioneering B.D. homestead autobiographical remarks are likely to predominate. However, expressed as personal and practical testimony, they may be valuable to other young married people among our readers, as well as for the solving of the approaching new "social question", concerning mankind, health, food and land, in general.

Our 3-1/2 acres contain woodland, clover, hay fields, pasture, orchards, a brook and pond, and a 100′ by 150′ vegetable and berry garden. Since 1955 we have been successful in raising all our milk, eggs, meats, vegetables and fruits along strictly B.D. lines. Greater health and creativity of humans, animals and plants has been our reward. The four Toggenburg milk goats (Bambi, Peppina, Frisky and Ringelblume) had nine kids this spring. The barn houses rabbits, chickens and ducks. We purchase among our staples B.D. wheat, rye, oats, potatoes, cheese, butter, oil, nuts, honey and some feeds. Otherwise the operation constitutes a closed circle.

Why, you might ask, would an intellectual (I am a college professor, student of the history of politics and of ecology) expose himself to such a peasant way of life? The answer is simple: it is exactly this living in and with Nature which inspires our intellectual and artistic inclinations. We had, already before our marriage, a vision of a life and personality development that could act as an antidote to the extreme individualization, depersonalization and combativeness found in the present world, and at the same time could transport into the coming age all that is positively sane, humane, beautiful, good and truthful in our tradition. The first key seemed to us to lie in a large family living in the countryside. It could provide for personality development, individual creativeness, the cooperative spirit, meditation, a purposeful life of material and spiritual achievements. Together with other similar families ours could become a bridge to a new integration of society.

The familial aspect of this vision has worked well: in the first minutes of the New Year our seventh child was born. Add to this that we finally succeeded in finding a physician who was willing to contribute to a new creative pattern of life when mother, father and the doctor assisted at the greatest moment

in Nature, *birth*. That all our births had been "natural", and that the vision of a healthy, normal and happy family life came true, we largely owe to the B.D. practices of agriculture. Ten years ago, at the 1949 B.D. Conference, we met Dr. Pfeiffer and have ever since been grateful to him and his scientific accomplishments.

Now the large family had become a reality. We had finished building our house, greenhouse[1] and barns. The homestead functioned. As you know, it is the father's function to make life as a family unit as instructive and creative as possible. Consequently, we would discuss at meal times various projects and essential issues. By the end of January this year's program had taken the following shape. We would have to increase production of quality food, as well as increase the daily cultural and intellectual fare of a growing family. The mother had to have more time than ever for furthering artistic and musical talents, for welcoming the increasing number of our children's school friends. The father was becoming ever deeper immersed in a virgin intellectual field which I like to term Political Ecology (investigating the relationship of politics to ecology, especially in the solving of the coming "social question"). It became obvious that we were not in need of a TV set, nor an outdoor grill, new patio, gold-fish pond and all the rest of Madison Avenue's temptations for suburbia and exurbia, nor were we to acquire more land or machinery. We had to concentrate on production intensification. In microcosm we were actually embarking on an experiment about to become vastly important and significant for the macrocosm: solving the problem of world food supply and the rise of world population, *without* synthetic chemicals, pesticides, hormones, isotopes and the like.

First, intensification can come about by a machinery and tool increase; secondly, by working-time rationalization; thirdly, by biological intensification. Here are some samples of our investigation and practical applications.

Increasing Use of Hand Tools

The role of a teacher, as you know, is not primarily to lecture (the student can always read a text book), but to investigate, in all humility, together with the student, the issues at hand. This leads to thinking and arriving at "spontaneously discovered" insights on the pupil's part. Thus at home too, we

(1) for details see article "The Greenhouse on the B.D. Homestead", Bio-Dynamics, Fall 1958, Number 48.

worked our way through to a unanimous realization and consequent decision to use less machinery (not to speak of buying any more), and to apply more of the proper hand tools and carefully calculated human labor. Investment in machinery should be held to an economic minimum. Machines should possibly be so constructed that they fulfill a large number of roles and are geared to "organics". Their maintenance in top condition at all times should be as little time-consuming as possible. We find the rototiller one of the best universal machines. Yet, we had observed adverse soil responses to frequent tiller cultivation. More cultivation had to become manual again. Besides, the man-power was available and a constructive use of it should be made. Remember, part of the purpose of living on a homestead is precisely the education of the child to which belongs, unfortunately often neglected today, in love for and ability to *work*, a habit which made this country great. Doing this, the younger children gained in their self respect and sense of importance, the older ones discovered that these short daily periods of communal labor are actually fun, exciting and put them into a true physical shape (placing them in front in school sports, for example). The rhythm of work on an "organic" homestead prevents extremes. It builds up body and mind. Thus, mother was happy to have no colds on her hands these past winters.

You know that historically the family has always been a productive unit and in that process also an educational one. The conscious peasant household can easily reap pedagogical advantages, almost unavailable to the city family. We have begun to realize how the continuous adjustment of and lively attention paid to the use of various tools in different chores, at different times and adjusted to actual human energy available, is a powerful remedy for the irresponsible use of machinery, resulting so frequently from the stultification of the human senses, caused increasingly by the utilization of so-called labor-saving devices. When the tool again takes its place next to the machine and becomes a true elongation of human capacity, the attitude of stewardship towards Nature and Creation can again develop and the purely materialistic approach — already so catastrophic in modern agriculture — can once more be subjected to spiritual man. In our case, the results so far have been actually a work intensification with time saved and Nature husbanded.

Efficient Time Utilization

To further efficiency, shorten chores, routes to and from

barns, storage places, etc., we reordered tool sheds, feed bins, storage facilities. Since the children do many of the chores (feed chickens and observe their behavior, collect eggs, stake out goats, etc.), their suggestions were actually the most valuable ones. We decided on an orderly dispersal of tool storage, for example. There are *several* strategic spots where rakes, shovels, hoes, etc., can be found. The important thing is to return the tool to *its* place. Thus time is rationalized. Orderly behavior and orderly thinking is learned by doing. There is, of course, not the antiseptic look of suburban cleanliness about the place, but there is the functionalism of a peasant household and above all, less lost time, in our case applied to cultural and intellectual pursuits. Studies have shown that this approach could save a farmer many miles and labor hours a week.

Biological Intensification

The most rewarding, yet difficult, project remains, doubtless the mobilization of Nature. To help Nature to help Man can indeed become the challenge to any "organic" husbandman. It is the key to our B.D. homesteading; the *joy* in the wholesome way of life; the factor which makes it not drudgery for young and old, but an ever fascinating venture in life. Once gardeners, peasants and farmers capture this spark, their work will be more meaningful and more satisfying than the biggest materialistic incentives ever dreamt of.

Moon Chart

During Christmas vacation one can draw a large moon chart for the coming season. A new moon on New Year's Eve occurs every 19 years and forecasts a sunny growing season; a full moon (as we had this time) forebodes a wet year. (This prospective, relatively wet soil helped us also decide against increased machine use; moreover, we were not planning extensive mulching, but rather plenty of aerating cultivation). You know that the new moon slows growth, the full moon furthers it. Thus, when pruning trees, berry bushes, vines (during February when no sap runs) await the full moon, when strong growth is desired, prune around new moon for short growth. Similarly, early sowing produces nourishing plants, late sowings plants with strong hereditary factors. When planting the latter's seeds, increased quality bulk is produced. Thus the summer's sun and the winter's moon mutually enhance output. Set within this rhythm, the orderly knowledge of the following samples is helpful.

Cabbage varieties to be sown in new moon, transplanted in period of waxing to full moon.

Spinach sown in waning moon to forestall bolting.

Melon, squash and *cucumber* seeds planted in waning moon for rich meat, in waxing to full moon for raising good seeds.

Leeks and *head lettuce* sown in waxing moon, transplanted in waning moon.

Peas sown three days before new moon, are most tender to eat when harvested at full moon.

Trees and *bushes* transplanted by waxing moon.

Fruits for *seeds* and *herb* cuttings harvested at full moon.

Soil Care

The earth inhales any time after about 4 P. M. and exhales in the morning. Surrounding forces (including cosmic ones, humidity, sprays, etc.) enter thus best during the evening. In order to further root growth, water in the evening. The plant above ground grows during the early morning sunshine. At noon (as well as midnight) a plant sleeps; best time, therefore, to pull weeds, but not to cultivate deeply. We use the crile (potato hook) just to break the surface, killing young weeds and breaking off the capillary action upwards (evaporation). This is necessary after every rain upon exposed earth. For deep cultivation we get up early, preferably before sunrise, when the surrounding of the soil is still very similar to its interior (cool, dark, damp). Have no deep cultivation after 8 A. M.! To experience the awakening of Nature and the sun rise is a thrill to young and old. We try to think in terms of the natural factors and try to get a feeling for them. In cultivating it is the proper distribution and relationship of air-light-warmth-water that sustains a healthy soil life and thus healthy plant growth. Especially necessary is cultivation during a rainy spell, because oxygen is the enemy of all harmful bacteria.

Wind

A much neglected ally or foe is the wind. We are learning to recognize wind-direction, wind-strength and related phenomena. This learning to *see* nature's phenomena is also a training in truthfulness and sensate feeling. Among children and adults to develop this feeling for Nature's ways, for plants, for soil, for animals, for other human beings (!), *this* alone means to subject the earth under man. Anything else is exploitation with all its catastrophical consequences. A hedged-around gar-

den will keep a harmful wind out and hold in dew, aromatic oils, warmth, etc., and the so important carbon dioxide which the living soil exhales and which is heavier than air. (Observe how healthy and huge plants usually grow under cow-barn windows, even if otherwise in stony and dry ground). But an orchard again wants to be placed in such a position that gentle winds can stroke it. Many fungus diseases appear at full moon and westerly winds. Equisetum and stinging nettle provide a protective spray. Or, when spraying with B.D. preparations 500 or 501, the early morning of a nice day with a mildly caressing humid wind is best. Conversely, the days of the waning moon with a dry wind are most effective for weeding.

Companion Planting

The intensification of production through companion planting and keeping some beneficial plant cover over the soil at all times during the growing season, is an almost unexplored topic.[2] One can plant in all bare spots radishes, spinach, cress, lettuce, dill, fennel, parsley, thyme, marjoram, clover varieties, etc. If the produce can't be consumed, the surplus can be given away or be fed to animals (rabbits, etc). The soil remains protected, comes very much alive and root excretions enrich the earth, which thus works for you. Lettuce varieties planted in such dispersal help ward off tiny black earth fleas. New Zealand spinach is a specially hardy ground cover and also beneficial in between tomatoes. Bushbeans can be interplanted with profit. Between strawberries their enriching function is quickly noticed. Nettles (*urtica dioica*) make excellent soil covers under and around fruit trees, berry bushes and rhubarb. Cut several times a year and leave for mulch. Nettles are flat rooters and instead of depriving the tree of nourishment, they add phosphate, potash, nitrogen, calcium, silicate and iron. Their iron content has been particularly beneficial during the wet spells this summer in controlling lice, slugs and snails. The spraying of fermented nettle solution increases root formation, because of its high protein content.

Intensification and Cooperation

Let me conclude with the observation that such a happy, healthy and fascinating self-sufficiency can never be an end in itself. True, in a large family there is no lack of opportunities to exercise the social dimension of man. On the contrary, one

(2) Cf. Richard Gregg, "Companion Plants", Bio-Dynamics, vol. III, No. 1 for the best summary to date.

will have to decide on a few which focus the effort expended on some crucial field. In our case this means the children's school, for example, *and* the activization of responsibility towards fellowman who is *not* enjoying our paradisiacal condition.

Walter Stuber and his helpers had started under many sacrifices and with much idealism a system of supplying consumers with healthgiving B.D. products. This is the beginning of a producer-consumer cooperation without which B.D. production on a wide and diversified basis is impossible. Without such widespread production our fellowmen and one's country can never sufficiently profit from the pioneering work of the Biochemical Research Laboratory. There is no doubt that the scientific integrity of Dr. Pfeiffer and his laboratory is increaseingly recognized and verified by national and international authorities and agencies. This will continue at an ever increased pace. But it is in the application, in the doing, wherein lies hope for many more people. And here the marketing problem is almost superseding the production questions of yesterday. We favor consumers cooperatives as among the best solutions available.

Since the many activities on a productive family homestead have a life rhythm, it is always possible to integrate another activity without breaking the proverbial camel's back. So we provided storage and delivery facilities for such a housewife co-op in Rockland County. It has been revealing and wonderful to meet the many consumers, learn of their visions and problems, see the average American's appalling struggle to obtain healthgiving food! We would not want to be without this social dimension of our existence. But it has also been dismaying to see people drift in and out of this cooperative arrangement.

If this country and the positive aspects of its civilization are to survive, the people's health, quality food and social fulfillment must be placed on a new solid footing. Here is where Political Ecology comes in again. The new "social question" has very little to do with emancipation, social security and the other legitimate solutions to previous "social questions", but a great deal with making it possible for man to live sanely, healthily and purposefully in a *humane* environment. It seems to us that the Golden Acres Farm venture into marketing is only the beginning of what must needs follow.

Therefore, I would like to conclude with two suggestions which could strengthen this pioneering movement. Consumers

must obtain a feeling of personal belonging and commitment to this particular cooperative arrangement. How about a communication medium; an informative and personal monthly newsletter to all members? How about a more formalized membership in the form of financial dividends?

The above is meant as witness to a way of life and as such it may help especially other young families in achieving what Lincoln predicted:

> *"the greatest art of the future will be to make a comfortable living off a small piece of land".*

BIO-DYNAMIC MARKET GARDENING

HEINZ GROTZKE

Market gardening is a well established and efficient branch of agriculture in this country. Specialized farms produce the bulk of vegetable crops demanded by the fresh market and processing industries. Planting, cultivation, and harvesting are smoothly carried out by mechanical equipment specially tailored for individual crops.

Market gardening, however, becomes a different subject altogether, if you name it bio-dynamic. To compare both methods and show some differences is the topic of this article.

The expression "bio-dynamic farm" reflects the idea of a non-specialized, self-supporting farm. Since such farms are so few, one which makes market gardening part of its business, is unwillingly condemned by the consumer to grow a large variety of vegetable crops. A large variety on small plots. So different from commercial growing! The economy of a bio-dynamic vegetable farm is therefore very weak and in the future may necessitate in growing a few crops which are especially suited to soil, climate, and the farm as a whole. Our idea became therefore to co-operate with other bio-dynamic growers, being then able to offer the same variety of vegetables to the consumer, grown however, by several farmers.

The practical growing of bio-dynamic vegetable crops differs completely from the methods of modern farming. Soil treatment as well as plant treatment are based on different grounds.

While the average farmer applies fertilizer to fields mainly as inorganic substances, the bio-dynamic farmer is bound to use

organic products only, as they are formed through the process of composting. The methods of composting were scientifically developed and guarantee an end-product of unsurpassed value in regard to plant nutrition and soil improvement. The adding of this compost to the soil does not follow the theory of replacing elements taken up by plants but strives to increase soil life and formation of stable humus. The importance of both factors are known to soil science, though practical agriculture is overlooking them completely.

Cover crops are generally grown by every bio-dynamic farmer for the steady improvement of the soil, giving preference to the legumes as an additional source of nitrogen. With the practices of composting, green-manuring, and good soil management bio-dynamic farmers have been able to increase the organic matter content of soils. I know of no modern farmer who can accomplish this with his chemical fertilizers and the advice given by salesmen and agents.

The bio-dynamic farmer certainly finds a great helper of soil-building in the earthworm. Its castings represent that type of stable humus which makes a raising of the humus-level possible. Only soil-organisms keep the secret of producing such humus. It becomes the storage place of nutritive solutions and water for the plants. It makes the soil crumbly, porous, and fertile and gives it a dark color.

The general practices of field preparation are identical, though a bio-dynamic farmer plows more shallow than deep in order not to decrease soil life. The aeration of the deeper layers is brought about by a subsoiler. Also the rototiller is, put to work at the right moment, a valuable tool for soil preparation. Frequent cultivation is a means of soil aeration, weed control, and water regulation. This way of soil mulching can be replaced by the use of such materials as straw, hay, plastics, etc.

Before plowing or any other field preparation the B.-D. Field Spray is sprayed on the ground. It insures a fast and correct decomposition of all crop residues and also brings to the ground preparation 500.

So far the differences have been of minor importance in respect to the cost of the end-product or crop. It is the bio-dynamic plant treatment which differs completely from the methods commonly employed. After magnifying the subject "plant treatment", only two main categories appear: The treat-

ment of the plant against a) diseases and b) insects. Drastically speaking the occurrence of both is already a sign that either climate or soil are not suited to the needs of the plant species in question. These two factors, climate and soil, will, however, be hardly ever ideal in market gardening. Therefore, the problems of diseases and insects must be considered as a reality.

The diseases of plants are bio-dynamically controlled with the foliage sprays 501 and 508, the latter being a tea of horsetail (equisetum arvense). Their application is not a direct means of control, indicating the necessity of early spraying. Together with right soil treatment these sprays almost guarantee a healthy development of vegetable crops. The control of diseases affecting fruit crops, especially brown rot, constitutes a more serious problem. The additional use of the bio-dynamic tree spray did not inhibit the spreading of brown rot in plums and peaches. Personally, I therefore differentiate — regarding fruit trees — between the tree and the fruit. All the above-mentioned practices of disease control hold true *for the tree,* meaning that its healthy development is guaranteed by following them. The infection of *the fruit,* however, is still an unsolved problem and requires intensive research and work. It would be unfair, not to mention this. In a year with unfavorable weather the loss from diseases in fruit growing is remarkable.

Not quite as discouraging is the control of insects, both in orchard and garden. Several steps can be taken to decrease their population to an amount which can not be considered destructive. The latest invention of control is the electric insect trap, the value of which was discussed in Bio-Dynamics No. 46. Ideas to improve them were received from several members. Their effectiveness can neither be overlooked nor denied, because they fulfill ideally the purpose of trapping the insects which are needed to carry out the bio-dynamic practice of burning them.

The main damaging orchard insects — such as curculio and codling moth — develop within the growing fruit and make it drop. The picking up of all dropped fruit is consequently a necessary part of insect control, since with each fruit at least one immature insect has been caught. Similar is the practice of trapping the curculio by shaking the trees early in the morning. They then fall down on a canvas or plastic sheet that has been spread under the crown beforehand. When putting them

into a glass jar it should be watched they do not get out again because they easily climb up the glass wall.

Repellent sprays of herbs or fermenting organic liquids are another means of insect control for orchard and vegetable garden. Not too many experiences have been collected, but it will be worth the effort to experiment in this field. Not only the insects might be baffled but also the quality of the food plants can be improved.

In vegetable growing some insects can become a problem. I am thinking of the bean beetle for example which is able to ruin more than half of a bean crop. Its appearance is closely connected with the condition of the soil. Beans grown on poorly aerated soil are obviously prone to an insect attack. It does not matter whether this lack of aeration was caused by low organic matter content, insufficient cultivation, or excessive rainfall. In each case the plant is undoubtedly weakened and open to such attacks. The only solution that remains in all such cases is the use of plant poisons in the form of sprays or dusts. The general choice is rotenone since it is completely harmless to man, animal, and plant.

Compared to our neighboring farmer the bio-dynamic methods of plant treatment are not backed by a nationwide scientific research program, require more time, presume more accurate observation, require one's own thinking and decisions, and are not as effective within the same time space. But from the points of health and nutrition, the bio-dynamic product is one of quality which secures an undisturbed development of the plants. Much effort and patience are needed to grow it, and only a high moral attitude towards man can be the background for continuously trying — disregarding failures and losses — to establish this type of farming.

After soil and plant treatment produce a quality food-item, this has to be harvested. The production cost is mainly determined by this activity since due to comparatively small field plots mechanical equipment cannot be used and expensive labor must be expended. Common market gardening, on the contrary, employs the cheapest labor available and the most modern harvesting machinery. In competing with it, this is our weakest point, as far as price is concerned.

Interesting is the human side of this problem. The harvesting is partly done on our farm by students. If there was no interest in the work before, it definitely comes with the time

of harvesting. After one day of picking bush beans, for example, everybody reveals his ideas of how this can be improved. Some advise growing the beans on benches only or making a deep ditch for walking between every four rows. A possible solution would also be to pull out the mature plants and pick the beans off afterwards in the shade. One student wanted to spend all his future energy on inventing a mechanical bean-picker. When I explained that such machines were already on the market he could not understand why we do not use them. Knowing this, bean-picking was much harder. The truth which can be derived from these reactions is, that nobody likes hand labor any more. A machine is supposed to take over and then creates the danger of depriving us of the personal contact with and understanding of the plant.

Similar to the harvest problem and second in determining the production cost is the control of weeds. Where commercial gardening uses the most modern weed-killers or herbicides, bio-dynamic gardeners must employ again expensive hand labor. Whoever has tried to weed three acres of carrots by hand knows what task he sets himself. More than one boy never came back to work after a few days of weeding and seeing no other work on the horizon. Cultivation and mulching can eliminate weeds only in certain crops while many require hand-weeding. Weeds become a problem especially in the case of small and slow germinating seeds, such as carrots, onions, and chives. The bio-dynamic control of weeds in these crops demands concentrated efforts of research because otherwise the growing of such vegetables is very limited.

If so far everything has been done right, another factor largely decides success or failure in market gardening. This is the weather with its forces of frost and heat, rain and drought. Anyone of these can ruin a vegetable crop, and the help of man is sometimes quite ineffective. Against frost he might employ protective measures; however, heat can burn plants or make them wilt. Against drought he might turn on irrigation systems, but he is helpless if rain pours down for days. Then the soil turns into a mudhole, the plants may wilt as in a drought, and the root crops rot in the ground. Weather is the unknown factor in market gardening, and unconcerned is only the greenhouse gardener. Many advantages are on his side, especially if he grows food crops bio-dynamically.

Before concluding this paper, one fact must be mentioned

which holds true for common market gardening as well as bio-dynamic market gardening. The gardener who grows crops extensively experiences unfortunately the impossibility of giving all plants loving care. He forgets to know the first names of them all and is pressed by the term economy. Grow for profit or don't grow at all!

BOOK REVIEWS

A History of Organics

"The Stuff We're Made Of", by Jorian Jenks, published 1959 by the Devin-Adair Company, New York, 246 pages, $5.00.

The author, in his preface, describes his work as "an attempt to meet the need for a straightforward account of what has come to be known as the organic movement". He himself acknowledges the difficulty of writing any history of things in which one is, oneself, involved, pointing out that since he has come to believe wholeheartedly in the organic case he can "lay no claim to 'objectivity' in the sense of neutrality". Yet he does an excellent job of presenting the growth and development of various aspects of the organic approach. He is, also, most qualified for the task, with an orthodox agricultural college training, followed by years of work "instructing farmers in technical developments, more especially in the use of chemical fertilizers", and subsequently farming in England on his own account for a number of years. He has, since 1945, edited "Mother Earth", the journal of The Soil Association, in England.

The growth of the whole movement is well described in terms of the work of its leaders, the late Sir Albert Howard, Lady Eve Balfour and many others. Yet this reviewer, perhaps suffering from the same problem of personal involvement alluded to above (and yet again perhaps justifiably, on an objective basis) feels constrained to express regret that he was unable to find in the narration any picture at all of the Bio-Dynamic Movement which, at the very least, has been a part of the world-wide growth of the organic stream. Nor could he discover that Dr. Pfeiffer is anywhere referred to, except in the bibliography, where he is once described, accurately enough, as "a well-known biologist of the bio-dynamic school, who is also a practical farmer", and again, together with the late Erika Riese, as one of "two leading exponents of bio-dynamic methods". Nor did the section on large-scale composting of organic wastes include mention of Pfeiffer's admittedly important work in this field.

There is, obviously, no feeling of *unfriendliness* on the author's part. His one-paragraph appraisal of Dr. Rudolf Steiner, originator of the B.D. method, is worth quoting. Toward the end of a chapter on "The Fragmentation of Science and the Return to Wholeness", Mr. Jenks says that it "must not close without some reference to at least a few of the rebels of an earlier period". He then writes:

"Goethe, for example, was a distinguished scientist as well as a great poet and artist; and his philosophy later bore fruit in the studies and teaching of Dr. Rudolf Steiner. Steiner a scientist who developed great intuitive faculties and spiritual insight, is usually dismissed as an incomprehensible mystic by those who like to make clear-cut distinctions between the material and spiritual aspects of life. But his teaching on such diversified — though fundamentally related — subjects as education, health, the arts and sciences, and agriculture, had its roots in a well-integrated philosophy and has interested many thoughtful people besides his own disciples."

For readers of "Bio-Dynamics", who may be presumed to know something about the subject matter with which this periodical deals, Mr. Jenks's apparent omissions are, obviously, of little practical importance. To them, his book can be sincerely recommended as a means of getting a most necessary orientation in other aspects of the organic movement as a whole.

FRED HECKEL

REPORT ON MEMBERSHIPS

Since August 4, 1958 the Bio-Dynamic Farming and Gardening Association has gained 69 members and 77 new subscribers. Many of these new friends have become interested in Biodynamics through meetings of the Natural Food Associates.

Once again we would like to explain the difference between a *membership* and a *subscription.* As a subscriber one receives the four quarterly issues of the magazine BIO-DYNAMICS. A membership in the Association entitles one to several other benefits in addition. Here are some of these: reduced rates on soil tests; notices of the annual B. D. Conference which includes the meeting of the Association; Notices of the Farmers Conference held every year at Golden Acres Farm; copy of the Annual Report of the Biochemical Research Laboratory; information and consultation.

Chairman Membership Committee

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